

REMARKS

In the Office Action dated February 3, 2006, claims 22 – 29 stand rejected.

Applicants respectfully submit that the Examiner's rejections of claims 22 – 29 as set forth in the Office Action have been overcome and that claims 22 – 30 as amended are allowable over the cited art for the reasons set forth below.

A. Specification

Applicants have revised the specification according to the Examiner's suggestion.

B. Acronym

In the currently amended claim 22, the acronym CD has been spelled out as "compact disk." Hence, the objection has been overcome.

C. Written Description

Claims 22 – 29 stand rejected under 35 U.S.C. 112, ¶ 1 as failing to comply with the written description requirement. These rejections are respectfully traversed.

Specification, When Read as a Whole, Fully Describes a Unitary Portable Mass Storage

Device with an Integrated USB Plug

The Examiner, when determining whether Applicants' specification reasonably conveys to a skilled artisan that Applicants possessed the claimed invention, must read the specification as a whole. "[A] person of ordinary skill in the art is . . . to . . . read the claim term . . . in the context of the entire patent, including the specification." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005). "The court must always read the claims in view of the full specification." *Pfizer, Inc. v. Teva Pharms. USA, Inc.*, 429 F.3d 1364, 1373 (Fed.

Cir. 2005), citing *SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1285 (Fed. Cir. 2005). That is, “[t]he specification must be read as a whole to determine the structure capable of performing the claimed function.” *Default Proof Credit Card Sys. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005).

Applicants’ specification, when read as a whole, fully discloses a unitary portable mass storage device with an integrated USB plug. Among other things,

- Applicants’ specification discloses a portable data storage device. (“The invention relates to a portable data storage device, and in particular, a portable data storage device for a computer.” Lines 3-4, p.1);
- Applicants’ specification discloses a mass storage device serving as an alternative to a magnetic disk or CD. (“Examples of surface storage devices are magnetic disks and CD ROMs. Such data storage devices require a mechanical drive mechanism to be installed or coupled to the computer to permit the data on the storage device to be read by the computer. . . . An advantage of the invention is . . . providing a portable data storage device . . . which does not . . . include a mechanical drive mechanism to read the data from the data storage device.” Lines 13-25, p. 1 and lines 1-12, p. 2);
- Applicants’ specification discloses s a single device 10 that includes a USB plug 1 (FIG. 1); and
- Applicants’ specification discloses that the device 10 is plugged into a USB socket on a computer via the USB plug 1. (“[T]he plug 1 of the device 10 is plugged into [] a USB socket on a computer. After the device 10 has been plugged into the USB socket on the computer, a communication is established [] between the computer and the device 10.” Lines 18-20, p.5).

As a result, a skilled artisan, when reading Applicants' specification as a whole, can only reasonably conclude that the specification fully discloses a unitary portable mass storage device with an integrated USB plug.

Claim Language at Issue

Based upon the legal standard discussed above, again, Applicants respectfully reiterate that the specification, when read as a whole, reasonably conveys to persons skilled in the art that the inventor had possession of the claimed invention and that the specification expressly, implicitly, or inherently supports all of the limitations in the claim language.

Claim 22 (as amended) recites, in pertinent part:

22. A unitary portable data storage device which can be directly plugged into a universal serial bus (USB) socket of a computer and which is operative to function as an alternative to a magnetic disk or compact disk (CD), and which is capable of storing software for installation to the computer or of receiving and storing user's data present in the computer, the unitary portable data storage device comprising:

a USB plug integrated into the unitary portable data storage device without an intervening cable capable of coupling the unitary portable data storage device directly to a USB socket on a computer;

* * *

a non-volatile solid-state memory, said memory being non-removable from the unitary portable data storage device and having sufficient capacity to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD; and

a memory controller, the memory controller being coupled between the interface and the memory to control the flow of data between the memory and the USB plug in a manner to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD.

(Emphasis added).

Particularly, the Examiner objects to the phrases "without an intervening cable," "directly," "unitary," "integrated," "non-removable," and "having sufficient capacity . . . to serve as an alternative to a magnetic disk or CD." Again, Applicants address these objections in several segments as follows.

“USB plug . . . without an intervening cable capable of coupling . . . directly to a USB socket on a computer.”

Applicants respectfully submit that Applicants’ specification reasonably conveys to a skilled artisan that Applicants possessed the claimed invention. The reason is that, to comply with 35 U.S.C. § 112, ¶ 1, “the disclosure need only reasonably convey to persons skilled in the art that the inventor had possession of the subject matter in question.” *Fujikawa v. Wattanasin*, 93 F.3d 1159, 1570 (Fed. Cir. 1996); *Fiers v. Revel*, 984 F.2d 1164, 1170 (Fed. Cir. 1993); *In re Kaslow*, 707 F.2d 1366, 1375 (Fed. Cir. 1983); *see also Vas-Cath v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991). “The [Federal Circuit] and its predecessor have repeatedly held that claimed subject matter ‘need not be described *in haec verba*’ in the specification to satisfy the written description requirement.” *Univ. of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 922-23 (Fed. Cir. 2004). Even when the express or inherent support in the specification is not present, implicit support in the disclosure will suffice. *See* MPEP 2163(I)(B) (8th ed., August 2005) (“While there is no *in haec verba* requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure.”). Particularly, “the absence of definitions or details for well-established terms or procedures should not be the basis of a rejection under 35 U.S.C. 112, paragraph 1, for lack of adequate written description.” MPEP 2163(II)(A)(1) (8th ed., August 2005).

“[T]he Examiner agrees that the specification discloses that a USB plug of the disclosed device [] is plugged into a USB socket on a computer.” *See* p. 11 of the 2-3-2006 Office Action. However, by questioning “whether this connection is **direct** and **without a cable**,” again, the Examiner appears to be concerned about the possibility of an intervening cable between the USB plug and the USB socket. *See id.* Applicants respectfully reiterate that, even if such possibility exists (which it actually does not as will be explained below), the

Applicants, by disclosing a USB plug plugged into a USB socket on a computer, have already fully met their burden of “convey[ing] to persons skilled in the art that the inventor had possession of the subject matter in question[,]” *i.e.*, a portable storage device with a USB plug capable of being plugged **directly** into the USB socket on a computer **without an intervening cable**. *Fujikawa*, 93 F.3d at 1570; *Fiers*, 984 F.2d at 1170; *In re Kaslow*, 707 F.2d at 1375; *see also Vas-Cath*, 935 F.2d at 1563-64. The reason is that, as a skilled artisan would understand, when the USB plug disclosed in the specification is plugged into a USB socket on a computer (as agreed by the Examiner), such USB plug must be plugged **directly** into the USB socket on the computer **without an intervening cable** under the USB Specification. *See* paragraph 17 on pp. 8-9 of *Hyde Affidavit*; *see also* pp. 4-5 of *Kim Affidavit*. Consequently, Applicants believe that claims 22 – 30 are fully supported by the specification as required under 35 U.S.C. § 112, first paragraph in terms of “**directly**” and “**without an intervening cable**.”

Furthermore, Applicants respectfully reiterate that the possibility of an intervening cable does not exist here since such intervening cable was not permitted by the USB Specification at the time of the invention. The USB Specification defines the types of cables that are allowable under the Specification. At the time of the invention, the USB Specification did not allow an intervening cable between a USB plug and a USB socket. *See* paragraph 17 on pp. 8-9 of *Hyde Affidavit*. Therefore, as would be understood by a skilled artisan, the specification’s disclosure that the USB plug is plugged into a USB socket on a computer has under the USB Specification inevitably led to the disclosed USB plug’s capability of being **directly** plugged into a USB socket on a computer **without an intervening cable**. *See id.*

The Examiner suggested that “one skilled in the art would have associated Applicant[s’] claimed device that uses D12 with a USB [‘]B[’]-type plug and socket which

cannot be used to plug directly into a type-A socket of a computer without an intervening cable.” Applicants respectfully disagree. The reason is that, in addition to disclosing the use of D12, the specification also specifically discloses that the USB plug of the claimed device is plugged into a USB socket on a computer, as already agreed by the Examiner. As a result, since a USB socket on a computer would be understood by a skilled artisan to be a type-A USB socket, the disclosed USB plug would also be understood by a skilled artisan to be a type-A plug (as it is the only type of USB plug that can be plugged into a type-A USB socket on a computer). Consequently, the innovation of eliminating the need for USB B-type socket and intervening cable has been specifically disclosed in the specification originally filed, which discloses the type-A plug in the claimed device by specifying that such USB plug is plugged into a USB socket on a computer.

The above further supports the Applicants’ position that claims 22 – 30 are fully supported by the specification as required under 35 U.S.C. § 112, first paragraph in terms of “directly” and “without an intervening cable.”

“USB plug integrated into the unitary portable data storage device without an intervening cable” and “Said memory being non-removable”

Applicants respectfully reiterate that, as discussed above, “the disclosure need only reasonably convey to persons skilled in the art that the inventor had possession of the subject matter in question.” *Fujikawa*, 93 F.3d at 1570; *Fiers*, 984 F.2d at 1170; *In re Kaslow*, 707 F.2d at 1375; *see also Vas-Cath*, 935 F.2d at 1563-64. In addition, according to the MPEP, implicit support in the specification suffices. *See* MPEP 2163(I)(B) (8th ed., August 2005).

As mentioned in Applicants’ earlier response, throughout the entire specification, the disclosed device is shown as a single, whole, non-separable device 10 in Figure 1 and is always referred to as “a portable data storage device” or “the portable storage device” in the *singular* form. *See, e.g.*, page 1, lines 3 – 4, lines 24 – 25; page 2, lines 8 – 9; page 3, lines

12, 15 – 20 and 22; and page 4, line 21.¹ One passage in the specification, “[i]f the installation of the software is complete, . . . *the device 10 may then be removed [] from the USB socket on the computer*” (italics supplied), describes the entire *device 10* as being removed from the socket in one single motion. See page 7, lines 19-22. A skilled artisan, reading these disclosures, alone or together, would clearly understand that the inventor was in possession of a unitary and integrated device in which the USB plug is integrated into the unitary portable data storage device without an intervening cable or removable memory.

Again, the Examiner seems to be concerned with the possibility that a “single device” may have multiple non-integrated components removable by a user. Applicants respectfully reiterate that, even if such possibility exists (which it actually does not as will be explained below), Applicants, by (i) disclosing the claimed device’s singular nature and (ii) never mentioning any removable or non-integrated component, have fully met their burden of “convey[ing] to persons skilled in the art that the inventor had possession of the subject matter in question[.]” *i.e.*, a **unitary** portable storage device with all parts **integrated** and **non-removable**, as discussed in the previous paragraph. *Fujikawa*, 93 F.3d at 1570; *Fiers*, 984 F.2d at 1170; *In re Kaslow*, 707 F.2d at 1375; *see also Vas-Cath*, 935 F.2d at 1563-64. In addition, Applicants respectfully reiterate that a device **designed** to include **multiple** non-integrated or user-removable **components** during the device’s **normal course of usage** will

¹ The term “a” used throughout the entire specification in reference to the device 10 suggests that its elements are all part of the unitary and integrated device with no user-removable component. See *North Am. Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 1575-76 (Fed. Cir. 1993) (where there is no indication in the patent specification that the inventors intended the term “a” to have other than its normal singular meaning it was proper to limit the claims to a singular device). See also *Abtox, Inc. v. Exitron Corp.*, 122 F.3d 1019, 1023-24 (Fed. Cir. 1997) (*opinion amended on other grounds*) (use of the article “a” in connection with the element “metallic gas-confining chamber” suggests a single chamber, and repeated references to “said chamber” in various portions of the device are described in the claim reinforces the singular nature of the chamber).

not be understood by a skilled artisan as a **single** or **singular** device as multiple components are *factually* not single or singular.

In addition, in the Examiner's example of a personal computer, the Examiner stated that "[a] mother board for a personal computer can be considered a single device even though CPUs and memory modules are removable." See p. 13 of the 2-3-2006 Office Action. Applicants respectfully submit that CPUs and memory modules are not removed during the normal course of a mother board's usage. In fact, CPUs and memory modules must be connected to the mother board during a mother board's normal course of usage. Hence, Applicants respectfully submit that a mother board for a computer is not a proper example to counter Applicants' arguments.

This further supports the Applicants' position that claims 22 – 30 are fully supported by the specification as required under 35 U.S.C. § 112, first paragraph in terms of "**unitary**," "**integrated**," and "**non-removable**."

Furthermore, Applicants reiterate that a skilled artisan would understand that the employment of a Philips D12 component for device 10 in Figure 1 of the specification would result in the USB plug and the D12 component being integrated on the same printed circuit board (PCB). See paragraph 22 on pp. 10-11 of *Hyde Affidavit*; see also paragraph 19 of *Kim Affidavit*. Also, a skilled artisan would understand that, unlike certain types of memory chips that are intended to be removable from the device in which the chips are installed, flash memory chips are fixedly installed within a device and are "non-removable" under normal usage of the device. See paragraph 28 on p. 7 of *Kim Affidavit*. These further support Applicants' position that the specification teaches a unitary portable mass-storage device with an integrated USB plug and a non-removable flash memory.

Applicants reiterate that, as further evidence that the present invention discloses a unitary, integrated portable memory device with non-removable parts, the specification

discloses a “portable data storage device . . . which does not include *moving parts*” in lines 8-10 on page 2 (emphasis added). That is, the specification supports a portable data storage device designed to contain no part that moves relatively to other part(s).² If the USB plug is not “integrated” and is instead coupled to the rest of the device through an “intervening cable,” then clearly the flexibility of the cable will allow the USB plug to move around and hence results in at least one part that moves relatively to other part(s). Likewise, if the memory is not “non-removable” and instead can be separated from the rest of the device by a user, then clearly the mobility of the memory after being separated by the user results in at least one part that moves relatively to other part(s). These situations will directly contradict the clear disclosure of a “portable data storage device . . . which does not include *moving parts*” and hence will not be permissible.

The Examiner indicated that “[c]learly, the reference to the absence of moving parts refers to the absence of drive mechanisms or any mechanical moving parts associated with certain rotating prior art devices.” See p. 13 of the 2-3-2006 Office Action. Applicants respectfully submit that “moving parts” in the specification does not refer to only those in a “mechanical drive mechanism.” The reason is that the specification discloses “a device . . . [that] does not include moving parts or require a mechanical drive mechanism to read the data from the data storage device.” See lines 7-11 on p. 2 of Applicants’ specification. Later, the specification reiterates that “the device . . . does not require a mechanical operated reading/writing device[; in] addition, the device [] has no moving parts.” See lines 5-7 on p. 9 of Applicants specification. These distinct and separate references to “moving parts” in

² The specification discloses a “portable data storage device . . . which does not include moving parts *or* require a mechanical drive mechanism to read data from the data storage device” in lines 8-10 on page 2 (emphasis added). That is, the claimed invention does not (1) include moving parts *or* (2) require a mechanical drive mechanism (that may also contain moving parts) to read data from the data storage device.”

addition to those of “mechanical drive mechanism” and of “mechanical operated reading/writing device” indicate the absence of “moving parts” in the claimed device reaches beyond merely those “moving parts” in a “mechanical drive mechanism” or in a “mechanical operated reading/writing device.” In addition, Applicants respectfully submit the fact that a memory device of unitary construction may include moving parts does not logically prove or disprove Applicants’ contention that a memory device without any moving part must be unitary and integrated.

As a result, for at least the forgoing reasons, the Applicants have clearly and reasonably conveyed to those skilled in the art that Applicants were in possession of a *unitary* portable data storage device having a USB plug *integrated* into the unitary portable data storage device without an intervening cable that includes a *non-removable* memory. As such, claims 22 – 30 comply with the requirement under 35 U.S.C. § 112, first paragraph in terms of “unitary,” “integrated,” and “non-removable.”

“Said memory . . . having sufficient capacity to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD”

Applicants reiterate that the present application readily conveys to a skilled artisan that Applicants were in possession of the claimed invention. “[T]he disclosure need only reasonably convey to persons skilled in the art that the inventor had possession of the subject matter in question.” *Fujikawa*, 93 F.3d at 1570; *Fiers*, 984 F.2d at 1170; *In re Kaslow*, 707 F.2d at 1375; *see also Vas-Cath*, 935 F.2d at 1563-64. Furthermore, according to the MPEP, implicit support in the specification suffices. *See* MPEP 2163(I)(B) (8th ed., August 2005).

The Examiner stated that “[t]he disclosure is silent as to whether Applicants’ device was meant to have enough capacity to serve as an alternative to magnetic disks and CDs.” *See* pp. 13-14 in the 2-3-2006 Office Action. Applicants respectfully disagree. As discussed in Applicants’ previous response, the specification, by first describing the shortcomings of

magnetic disks or CDs and then introducing the advantage of the claimed invention over such magnetic disks or CDs, clearly intends for the claimed invention to serve as an alternative to them.³ Because the specification clearly intends for the claimed invention to serve as an alternative to magnetic disks or CDs, a skilled artisan would understand that the inventors were in possession of a portable memory device with a memory having sufficient capacity to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD. Hence, by unambiguously disclosing the intention for the claimed invention to serve as an alternative to magnetic disks and CDs, the specification has expressly, implicitly, or inherently supported the claimed invention's *storage capacity* to be at least comparable to that of a magnetic disk or CD.

As a result, the Applicants have clearly and reasonably conveyed to those skilled in the art that Applicants were in possession of a unitary portable data storage device having a memory with *sufficient capacity* to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD. As such, claims 22 – 30 complies with the requirement under 35 U.S.C. § 112, first paragraph in terms of “**sufficient capacity**.”

³ “[M]agnetic disks and CD ROMs . . . require a mechanical drive mechanism to be installed in or coupled to the computer to permit the data on the storage device to be read by the computer. . . . [T]he combination of the storage device and the drive mechanism for reading data from the storage device is generally bulky and/or delicate due to the moving parts that are required within the drive mechanism and/or storage device. . . . An advantage of the invention is . . . to provide a portable data storage device . . . which does not include moving parts or require a mechanical drive mechanism to read the data from the data storage device.” See pp. 1-2 of the specification.

D. Prior Art - Anticipation

1. U.S. Patent No. 6,038,320 (hereinafter “Miller”)

The Examiner rejected claims 22 – 24 and 26 – 28 under 35 U.S.C. § 102 as being anticipated by *Miller*. Again, Applicants respectfully traverse. Applicants submit that *Miller* does not disclose each and every element of the claimed invention.

Miller describes a security key that does not have the capability or capacity to serve as a mass-storage device, such as a “magnetic disk or CD.” The pending claims recite a unitary portable data storage device having, among other elements, “[a] memory being non-removable from the unitary portable data storage device and having sufficient capacity to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD” as well as “[a] memory controller being coupled between the interface and the memory to control the flow of data between the memory and the USB plug in a manner to enable the unitary portable data storage device to operate as an alternative to a magnetic disk or CD.” Here in the pending claims, the recited limitations: (1) the memory “having sufficient capacity to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD” and (2) the memory controller “to control the flow of data between the memory and the USB plug in a manner to enable the unitary portable data storage device to operate as an alternative to a magnetic disk or CD” are structural limitations because they describe physical characteristics of the claimed device: the capability to manage the flow of large amounts of data and the sufficient memory capacity to serve as a mass-storage device such as a magnetic disk or CD.⁴ Applicants reiterate that these structural

⁴ Applicants respectfully note that functional terms serve as structural limitations when they are used as adjectives to define the physical characteristics of the device. See *United States Filter Corp. v. Glegg Water Conditioning, Inc.*, 2005 WL 80947, *1 (D. Mass); *In re Garnero*, 412 F.2d 276 (CCPA 1969). See also *Vanguard Products Corp. v. Parker*

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limitations are not anticipated by *Miller*, which as a security key device does not have the capability or capacity to serve as a mass-storage device, such as a “*magnetic disk or CD*.”

Furthermore, *Miller* cannot send back the “*user’s data*” in its *original* (i.e., unencrypted) condition received and stored into the device like the present invention. To “*operate as an alternative to a magnetic disk or CD*,” the device in the present invention must be capable of sending back the “*user’s data*” in its *original* (i.e., unencrypted) condition received and stored into the device by a user, as such capability is fundamental to any conventional mass-storage memories such as a “*magnetic disk or CD*,” to which the unitary portable data storage device in the present invention “*operate[s] as an alternative*.” A key difference of the present invention from *Miller* is, therefore, in the present invention’s capability of sending back the *original* “*user’s data*” received and stored into the device by a user. The *Miller* device is capable of sending back *only* the *pre-assigned* key code already *pre-stored before shipping* inside the *Miller* device, as opposed to the *original* user password later selected by a user (i.e., the *original* “*user’s data*”). Note that the *original* user-selected password (i.e., the *original* “*user’s data*”) can *never* be sent back. The *Miller* device can send back *only the encrypted password or the error message* (depending on the password comparison results). In other words, nowhere in *Miller* is disclosed the capability of sending back the *original* “*user’s data*” (of the *original* user-selected password). As a result, the *Miller* device is clearly missing the present invention’s element of “[a] *memory controller being coupled between the interface and the memory to control the flow of data between the memory and the USB plug in a manner to enable the unitary portable data storage device to operate as an alternative to a magnetic disk or CD*” that is capable of sending back the *original* “*user’s data*” received and stored into the unitary data storage device by the user.

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Hannifan Corp., 234 F.3d 1370, 1372 (Fed. Cir. 2000); *Hazani v. U.S. Int’l Trade Comm’n*, 126 F.3d 1473, 1477 (Fed. Cir. 1997).

The Examiner suggested Applicants' claims do not include the limitation regarding "sending back the original user's data." Applicants respectfully disagree. As mentioned above, to "*operate as an alternative to a magnetic disk or CD*," the device in the present invention must be capable of sending back the "*user's data*" in its *original* condition received and stored into the device by a user, as such capability is fundamental to any conventional mass-storage memories such as a "magnetic disk or CD," to which the unitary portable data storage device in the present invention "*operate[s] as an alternative.*" As a result, by claiming a device that "*operate[s] as an alternative to a magnetic disk or CD*," the device in the present invention must be capable of sending back the "*user's data*" in its *original* condition received and stored into the device by a user.

For at least the foregoing reasons, *Miller* does not anticipate claims 22 – 24 and 26 – 28 of the present application. Thus, Applicants respectfully submit that claims 22 – 24 and 26 – 28 are patentable over *Miller* under 35 U.S.C. § 102.

2. U.S. Patent No. 6,457,099 (hereinafter "*Gilbert*")

The Examiner also rejected claims 22 – 24 and 26 – 28 under 35 U.S.C. § 102 as being anticipated by *Gilbert*. Applicants respectfully traverse. Applicants respectfully reiterate that *Gilbert* does not disclose each and every element of the claimed invention.

The Examiner stated that "the level of *Gilbert*'s disclosure [regarding a USB plug integrated into a unitary storage device] is comparable to that of Applicant[s]." Applicants respectfully disagree. See p. 15 of the 2-3-2006 Office Action. Applicants reiterate that, unlike Applicants' specification, *Gilbert* never discloses a "USB plug" as part of the device throughout the *Gilbert* specification and/or claims. This distinction is critical because it renders the *Gilbert* device incapable of direct connectivity.

Gilbert describes a Programmable Dedicated Application Card (PDAC) that requires the preferred embodiment described in Column 3, lines 16-19 and in Figure 1, to realize all of

the described capabilities. In this embodiment, the PDAC is connected to the computer's main internal bus and therefore has access to and intimate knowledge of the inner workings of the computer. Hence, no USB plug is disclosed in this internal embodiment. When using the alternative embodiment as described in Column 7, lines 12-16, however, the PDAC is external to the computer and therefore does not have the ability to access the inner workings of the computer. This alternative embodiment describes a peripheral computer connected through standard serial or network methods and running independent software. *Gilbert* only casually mentions USB in this alternative embodiment, and there is nothing to imply the use of an integrated USB plug to allow direct connection to the host computer.

The Examiner stated that *Gilbert* discloses a USB plug by indicating that "a user can simply plug the external PDAC [100] into any host computer." See p. 15 of the 2-3-2006 Office Action. Applicants respectfully traverse. Here, *Gilbert* discloses that the external version of the PDAC 100 can plug into a host computer via some "plugging" action (i.e., "plug" is used only as a verb in *Gilbert*). Unlike Applicants' specification, in which both a USB plug (i.e., "plug" as a noun) as part of Applicants' device and the "plugging" action (i.e., "plug" as a verb) of such USB plug are disclosed, nowhere in *Gilbert* is disclosed that such "plugging" action involves particularly any USB plug as part of the *Gilbert* device. In addition, the FIG. 1 of *Gilbert*, illustrating PDAC 100, shows no USB plug, which is further evidence that no USB plug has been disclosed in *Gilbert* as part of the *Gilbert* device. As a result, Applicants respectfully reiterate that *Gilbert* does not teach or disclose a USB plug integrated into a unitary device or a storage device as claimed in the present application and that such argument is not an implicit or any other sort of admission that the specification fails to support the claimed invention.⁵

⁵ The Examiner suggests that *Gilbert* (U.S. Patent No. 6,457,099), lines 12-16 & 22-26 in col. 7, discloses as much information on the integrated USB plug in question as Applicants do.

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In addition, Applicants respectfully reiterate that *Gilbert* does not teach a portable storage device capable of serving as an alternative to a magnetic disk or CD like the present invention. The reason is that, as opposed to a mass-storage device such as a “*magnetic disk or CD*,” what *Gilbert* really teaches is a PDAC that executes dedicated software application(s) ***pre-stored before shipping*** in the PDAC and sends only the ***results of running the software*** to a user via a host computer to which the PDAC is coupled. *See, e.g.*, lines 45-62 in col. 1. *Gilbert* teaches that a dedicated RISC processor in the PDAC running software improves execution speed. *Gilbert* also teaches that, by running the software on the PDAC instead of on the host computer, resources of the host computer are freed up for other tasks, thereby improving the host’s performance. *See, e.g.*, line 63 in col. 1 to line 7 in col. 2. *Gilbert* states that a PDAC is its own stand-alone computer system (as opposed to a mass-storage device that is only ***part*** of a complete computer system), and the use of a PDAC functions as a hardware accelerator and enhances the capabilities of the host computer system. *See, e.g.*, lines 33-36 in col. 2; lines 21-26 in col. 3. As a result, by disclosing a PDAC as a hardware accelerator, *Gilbert* does not teach a portable storage device capable of serving as an alternative to a magnetic disk or CD as the present invention.

For at least the foregoing reasons, Applicants respectfully submit that the new claims 22 – 24 and 26 – 28 are patentable over *Gilbert* under 35 U.S.C. § 102(3).

E. Prior Art - Obviousness

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Applicants respectfully disagree because what *Gilbert* discloses there, *inter alia*, is merely an external device that may plug into a host computer via a USB. Unlike the Applicants, *Gilbert* never discloses a USB plug as part of the device or a Philips D12 component that a skilled artisan would expect to be integrated with the USB plug on the same PCB (Applicants’ Figure 1) (*see* paragraph 22 on pp. 10-11 of *Hyde Affidavit*). These disclosures by the Applicants with the rest of Applicants’ specification as a whole clearly and reasonably convey to a skilled artisan that Applicants at the time of the application were in possession of a unitary storage device with an ***integrated USB plug***.

For the reasons discussed above, Applicants respectfully reiterate that neither *Miller* nor *Gilbert* anticipates the claimed invention. Also, Applicants respectfully reiterate that neither of them alone or in combination renders the claimed invention obvious. *Miller* is a security device that functions like an electronic key. To a skilled artisan, an electronic key is not similar to a mass-storage device. A skilled artisan will have no reason to increase the *Miller* device's memory capacity to the level of a mass-storage device capable of serving as an alternative to a magnetic disk or CD because the size of the stored key code or encrypted password is so tiny (*e.g.*, *Miller* suggests that the password can be six bytes, *see* lines 42-43 in col. 3).

In addition, Applicants respectfully reiterate that *Miller* actually teaches away from having a mass-storage device due to efficiency commonly sought by any skilled artisan in designing any kind of device. Because of the tiny memory capacity needed, a mass-storage device serving as an alternative to a magnetic disk or CD is not only unnecessary but also extremely wasteful and inefficient. In other words, to a skilled artisan, the *Miller* device should never have capability or capacity to serve as a mass-storage device.

Furthermore, as mentioned in Applicants' previous response, the secrecy of the stored data required by *Miller* also teaches away from functioning like a mass-storage device. As discussed above, the fundamental functionality of a mass-storage device capable of serving as an alternative to a magnetic disk or CD is to send back the original "user's data" stored by a user. The *Miller* device can never send back to the host computer the original user-selected password (*i.e.*, the original "user's data"). Only the encrypted password can be sent back. In fact, because of its secrecy, the original user-selected password (*i.e.*, the original "user's data") should never be sent back to the host computer. In other words, *Miller* actually teaches away from sending back the original "user's data," the functionality fundamental to a mass-storage device. That is, to a skilled artisan, the *Miller* device should never function like

a mass-storage device that sends back the original “user’s data.” As a result, because of all the reasons stated above, the *Miller* device does **not** render the present invention obvious to a skilled artisan.

Applicants respectfully reiterate that *Gilbert*, on the other hand, is a PDAC functioning like a programmable hardware accelerator. To a skilled artisan, a PDAC or a programmable hardware accelerator is not similar to a mass-storage device. A skilled artisan will have no reason to use a PDAC or a hardware accelerator as a mass-storage device capable of serving as an alternative to a magnetic disk or CD because the functionality of a PDAC or a hardware accelerator is very different from that of a mass-storage device capable of serving as an alternative to a magnetic disk or CD.

In addition, Applicants reiterate that *Gilbert* actually teaches away from functioning like a mass-storage device. The *Gilbert* device neither stores the “user’s data” into its non-volatile memory nor sends back to the host computer the “user’s data.” Only the results of running the software stored on the *Gilbert* device are sent back. In other words, *Gilbert* actually teaches away from sending back the “user’s data,” the functionality fundamental to a mass-storage device. As a result, because of all the reasons stated above, the *Gilbert* device does **not** render the present invention obvious to a skilled artisan.

Claims 25 stands rejected under 35 U.S.C. § 103 as being unpatentable for obviousness. Claims 25 depends from claim 22 and is patentable for at least the same rationale discussed in detail above.

Claim 29 stands rejected under 35 U.S.C. 103(a) as being unpatentable over *Margalit et al.* (U.S. Patent No. 6,748,451, hereinafter “*Margalit*”) in view of *Jha et al.* (U.S. Patent No. 6,407,949, hereinafter “*Jha*”). Claim 29 is dependent on claim 22 and is therefore allowable for all reasons set forth above. Claim 30 is dependent on claim 29 and is therefore allowable for all reasons set forth above. Moreover, Applicants respectfully reiterate that

Margalit discloses a security device that does not have the capability of serving as an alternative to a magnetic disk or CD.⁶ *Margalit* clearly states that the device is “analogous to a memory smart card.” Col. 4, lines 21-22. The amount of the information on a memory smart card is very small (up to only 1 KiloByte) because of such memory smart card’s very limited storage capacity at the time of the claimed invention. See paragraph 21 on p. 10 of *Hyde Affidavit*. This is entirely consistent with *Margalit*’s disclosure that its design can only hold a small amount of information, *i.e.*, “information characterizing a mobile user” See lines 27-32 in col. 6 of *Margalit*. “Such information may comprise user identify authentication information, banking information, access rights information, etc.” See *id.* Hence, “analogous to a memory smart card,” the *Margalit* device disclosed in its Figure 1 is designed to handle data of such very small amount. See lines 20-23 in col. 4 of *Margalit*. Since the amount of data stored is so small, there is no requirement to move this data into and out of the device at high performance. See paragraph 21 on p. 10 of *Hyde Affidavit*. In fact, *Margalit* teaches a CY7C63001A component, a low speed (1.5 Megabits per second) USB interface component, to be used in its “key” device, clearly indicating such slow data rate. See paragraph 22 on pp. 10-11 of *Hyde Affidavit*; see also Figures 3 and 4 of *Margalit*. As a result, a skilled artisan would understand that the CY7C63001A component taught in *Margalit* to handle only a small amount of slow data was not designed to operate in a mass-storage device serving as an alternative to a magnetic disk or CD, as claimed in Applicants’ application. See paragraphs 20-21 on p. 10 of *Hyde Affidavit*. Likewise, a skilled artisan would understand that the memory capacity employed to store such small amount of data in *Margalit* does not anticipate or render obvious claims directed to a memory having sufficient

⁶ *Margalit* describes that the PC treats the device as a specialist device and does not recognize it, or treat it, as mass-storage device like a magnetic disk or CD, as claimed in the Applicants’ application. See, *e.g.*, line 5, col. 7 to line 61, col. 9 in *Margalit*.

capacity to serve as an alternative to a magnetic disk or CD. *See id.* Hence, the *Margalit* “key” device contains neither a USB component having the capability nor a memory having the capacity to enable its device to operate as a mass-storage device like a magnetic disk or CD, as claimed in the Applicants’ application. In addition, *Margalit*’s small memory would be wholly inconsistent with the division of such already very small memory into a plurality of zones. Hence, there would be no motivation for a skilled artisan to combine *Margalit* and *Jha* to create multiple zones in the memory.

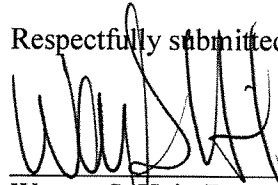
The Examiner suggested that Applicants’ contention above would render Applicants claims indefinite because “the specification is silent as to the storage capacity of the claimed device.” *See* p. 16 of the 2-3-2006 Office Action. Applicants respectfully disagree. As mentioned above, the specification, by first describing the shortcomings of magnetic disks or CDs and then introducing the advantage of the claimed invention over such magnetic disks or CDs, clearly intends for the claimed invention to serve as an alternative to them. Because the specification clearly intends for the claimed invention to serve as an alternative to magnetic disks or CDs, a skilled artisan would understand that the inventors were in possession of a portable memory device with a memory having sufficient capacity to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD. Hence, by unambiguously disclosing the intention for the claimed invention to serve as an alternative to magnetic disks and CDs, the specification has expressly, implicitly, or inherently supported the claimed invention’s *storage capacity* to be at least comparable to that of a magnetic disk or CD.

G. Conclusion

Applicants respectfully submit that claims 22 – 30 are fully supported by the specification as filed and are patentable over the cited art of record. As such, early notification of allowance of claims 22 – 30 is earnestly requested.

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Respectfully submitted,



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MARKED-UP COPY OF SUBSTITUTE SPECIFICATION

TITLE OF THE INVENTION

Portable data storage device capable of being directly
connected via USB plug to a computer

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This is a continuation of U.S. International Application No. PCT/SG00/00029,
filed on February 21, 2000.

BACKGROUND OF THE INVENTION

[0002] The invention relates to a portable data storage device, and in particular, a portable data storage device for a computer.

[0003] Conventional data storage devices generally fall into two categories. The first category is electronic, solid-state memory devices such as read only memory (ROM) and random access memory (RAM). These memory devices are generally fitted within the computer. They are not intended to be removable or portable so that they may be used on different computers, for example, to permit the transfer of data from one computer to another computer.

[0004] The second type of device is surface based data storage devices in which data is stored, typically, on the surface of a disk or tape. Examples of surface storage devices are magnetic disks and CD ROMs. Such data storage devices require a mechanical drive mechanism to be installed in or coupled to the computer to permit the data on the storage device to be read by the computer. In addition, such memory devices are limited by the surface area of the storage device, and the combination of the storage device and the drive

mechanism for reading data from the storage device is generally bulky and/or delicate due to the moving parts that are required within the drive mechanism and/or storage device.

BRIEF SUMMARY OF THE INVENTION

[0005] In accordance with the present invention, there is provided a portable data storage device comprising a coupling device for coupling to a computer serial bus, an interface device coupled to the coupling device, a memory control device and a non-volatile solid-state memory device; the memory control device being coupled between the interface device and the memory device to control the flow of data from the memory device to the coupling device.

[0006] An advantage of the invention is that by providing a portable data storage device comprising a coupling device with an interface device, memory control device and a non-volatile solid-state memory device, it is possible to provide a portable data storage device which may be coupled to a computer having a serial bus port and which does not include moving parts or require a mechanical drive mechanism to read the data from the data storage device.

[0007] Preferably, the non-volatile solid-state memory device may be a read/write memory device, such as a flash memory device.

[0008] Preferably, where the memory device is a read/write memory device, the memory control device controls the flow of data to and from the memory device.

[0009] Typically, the data storage device further comprises a manually operated switch movable between a first position in which writing of data to the memory device is enabled, and a second position in which writing of data to the memory device is prevented.

[0010] Preferably, the memory control device may include a read only memory which stores a program to control the operation of the memory control device. Preferably, the memory control device is a micro-controller.

[0011] Typically, the interface device comprises a universal serial bus (USB) driver to convert data between a USB format and a PC format, and the coupling device comprises a USB coupling device.

[0012] Alternatively, the interface device comprises a driver for IEEE 1394 (Firewire) protocol, and the coupling device comprises a Firewire coupling device.

BRIEF DESCRIPTION OF DRAWINGS

[0013] An example of a data storage device in accordance with the invention will now be described to the accompanying drawings, in which:

[0014] FIG. 1 is a schematic block diagram of a portable data storage device;

[0015] FIG. 2 is a flow diagram showing the initial setup of the data storage device by a software supplier;

[0016] FIG. 3 is a flow diagram showing the initial setup of the data storage device by an end user; and

[0017] FIG. 4 is a flow diagram showing operation of the data storage device.

DETAILED DESCRIPTION OF THE INVENTION

[0018] FIG. 1 shows a data storage device 10 which includes a USB plug 1 which is coupled to a USB interface device 2. The USB interface device 2 is coupled to a micro-controller 3 which is coupled to a flash memory 4. The micro-controller 3 includes a read

only memory (ROM) 5 which stores a program to control the operation of the micro-controller 3.

[0019] The operations performed by the micro-controller 3 include comparing passwords entered by a user with a corresponding password stored in the flash memory 4 to determine whether the user is authorised to access the contents of the flash memory 4. The program stored in the ROM 5 also controls the data flow to and from the flash memory 4 and can also detect whether the computer to which the memory device 1 is coupled has installed software programs which correspond to passwords stored in the flash memory 4. The micro-controller 3 can automatically retrieve passwords from the installed software to compare with passwords stored in the flash memory to verify that a user of the computer is authorised to access and run the software. In addition, the program stored in the ROM 5 also permits the setting of a password in the flash memory by a software supplier to correspond to the password contained in software supplied to a user. Typically, the password may correspond to the serial number of the software.

[0020] The flash memory 4 is typically divided into a number of different sections or zones. Typically, the flash memory is divided into two zones and each zone has a unique password. If the data storage device 10 is supplied with packaged software, the software serial number can be set in one zone to be the password to permit a user to access and use the software. The other zone, which can be used typically for storing a user's data, may have a separate password which is set by the user. Typically, the passwords are stored in a secure location of the flash memory in an encrypted form. The encryption, decryption, data flow control and USB protocol are all managed by the micro-controller 3.

[0021] The micro-controller 3 also includes a random access memory (RAM) 6 which is a temporary storage area to permit functioning of the micro-controller 3. In addition, a

manual switch 7 is coupled between the flash memory 4 and the micro-controller 3. The manual switch 7 is movable between a first position in which a user may write data to the flash memory 4 and a second position in which data is prevented from being written to the flash memory 4.

[0022] The device 10 also includes a USB socket 8 that is coupled directly to the USB plug 1 and permits other USB devices to be coupled to the USB via the device 10. For example, if a user wishes to increase memory space, a USB plug 1 of a second memory device 10 may be connected to the USB socket 8.

[0023] FIG. 2 is a flow diagram showing the set up procedure for the device 10 for a software supplier when the software supplier intends to supply the device as an authentication device for the software. Firstly, the plug 1 of the device 10 is plugged into 20 to a USB socket on a computer. After the device 10 has been plugged into the USB socket on the computer, a communication is established 21 between the computer and the device 10. The software supplier has pre-installed installation software on the computer which is run by the operator. From the pre-installed software, the operator selects password set up installation 22, in response to which the pre-installed software requests the operator to enter a password or serial number corresponding to the software with which the device 10 is to be supplied. The password or serial number is then encrypted 26 and stored 27 in the flash memory 4.

[0024] FIG. 3 is a flow diagram showing the initial set-up of a password for zone 2 of the flash memory 4 by an end user. The device 10 is typically supplied with driver software that is loaded by the user onto the computer prior to set-up of the device. To set-up the password for zone 2 the user plugs in 20 the device 10 into a USB port on the computer and communication 21 is established between the computer and the device 10. The user then runs the driver software and the driver software enters a password installation set-up mode 23 for

zone 2. The user then enters 28 a password that they wish to use to prevent unauthorised access to zone 2 of the flash memory 4. The password entered is then encrypted 29 and stored 30 in the flash memory 4.

[0025] After an end user has performed the initial password set up procedure described above and shown in FIG. 3, when a user plugs in 20 the device 10 to a USB port on a computer, the computer will establish a communication 21 with the device 10 and firstly, checks 33 an installation status flag stored in the flash memory 4 (see FIG. 4). If the status flag is "Y", the device 10 outputs 34 an "OK" flag to the computer. The micro-controller 3 then instructs the computer to issue a request 35 to the user to select the zone they wish to enter. If the status flag is "N", the device does not output an "OK" flag to the computer, and goes straight to step 35. In response to the request 35 for zone selection, the user selects 36 either zone 1 or zone 2.

[0026] If zone 1 is selected, the device 10 assumes that the user wishes to install software on the computer which is stored in the flash memory 4 and requests 37 the appropriate password for confirmation that the user is authorised to install the software. The micro-controller 3 receives the password entered by the user, retrieves the zone 1 password stored in the flash memory 4, decrypts the zone 1 password and compares it with the password entered by the user to authenticate 38 whether the user is authorised to install the software. If the passwords do not match, the device 10 prompts the computer to request 37- the user to enter the password again.

[0027] If the password entered by the user matches the password stored in the flash memory 4, the micro-controller 3 starts 39 the software installation from the flash memory 4 to the computer. In order to install software, the computer sends 40 a read/write command in USB format to the micro-controller 3 for data, the micro-controller 3 retrieves the requested

data from the flash memory 4 and sends 41 the data to the driver 2. The driver 2 converts 42 the data to PC format and outputs the data to the computer through the USB plug 1. The micro-controller 3 then checks 43 whether the software installation is complete. If the operation is not complete, the operation returns to step 40. If the installation of the software is complete, the status flag stored in the flash memory 4 is changed to "Y" and the device 10 may then be removed 45 from the USB socket on the computer.

[0028] If a user selects zone 2, the micro-controller 3 sends a command to the computer to request 46 the user to enter the password for zone 2. When the user enters the password, the computer sends the password to the micro-controller 3. The micro-controller 3 retrieves the password for zone 2 from the flash memory 4, decrypts 47 the password and compares it with the password entered by the user. If the password entered by the user is incorrect, the operation returns to step 46 and the computer requests 46 the user for the password again.

[0029] If the password entered by the user is correct, the user has access to zone 2 of the flash memory 4 to read data from the flash memory 4 and to write data to the flash memory 4. However, data can only be written to the flash memory 4 if the manual switch 7 is in the position to permit data to be written to the flash memory 4. In order to read or write data from or to the flash memory 4 a read or write command is sent 48 by the computer in USB format to the micro-controller 3. In response to the read or write command the micro-controller 3 either retrieves 49 data from the flash memory 4 and sends it to the driver 2 for conversion 50 to PC format and then to be output to the computer or receives data from the driver to write it to the flash memory 4.

[0030] The micro-controller 3 then determines 51 whether the read or write operation is complete. If the operation is not complete it returns to step 48. If the operation is complete the operation terminates 52.

[0031] The device 10 described above is for coupling to a universal serial bus (USB). However, the plug 1, the interface device 2 and socket 8 could be for use with any appropriate computer serial bus. For example, the device 10 could be modified for use with IEEE 1394 (Firewire) protocol by substituting the USB plug 1, USB interface device 2 and socket 8 with a Firewire protocol compatible plug, interface device and socket respectively.

[0032] An advantage of the device 10 described above is that it provides a portable data storage device for a computer which does not require a mechanical operated reading/writing device. In addition, the device 10 has no moving parts. This enables to data storage device 10 to be more compact than conventional portable data storage devices.

CLAIMS

1-21. (canceled)

22. (currently amended) A unitary portable data storage device which can be directly plugged into a universal serial bus (USB) socket of a computer and which is operative to function as an alternative to a magnetic disk or compact disk (CD), and which is capable of storing software for installation to the computer or of receiving and storing user's data present in the computer, the unitary portable data storage device comprising:

a USB plug integrated into the unitary portable data storage device without an intervening cable capable of coupling the unitary portable data storage device directly to a USB socket on a computer;

a single interface, said interface allowing the unitary portable data storage device to communicate via the USB protocol and being coupled to the USB plug;

a non-volatile solid-state memory, said memory being non-removable from the unitary portable data storage device and having sufficient capacity to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD; and

a memory controller, the memory controller being coupled between the interface and the memory to control the flow of data between the memory and the USB plug in a manner to enable the unitary portable data storage device to serve as an alternative to a magnetic disk or CD.

23. (previously presented) A unitary portable data storage device according to claim 22, wherein the memory controller is non-removable from the unitary portable data storage device.

24. (previously presented) A unitary portable data storage device according to claim 22, wherein the non-volatile solid-state memory is a flash memory.

25. (previously presented) A unitary portable data storage device according to claim 22, further comprising a manually operated switch movable between a first position in which writing of data to the memory is enabled, and a second position in which writing of data to the memory is prevented.

26. (previously presented) A unitary portable data storage device according to claim 22, wherein the memory controller comprises a micro-controller.

27. (previously presented) A unitary portable data storage device according to claim 26, wherein the micro-controller includes a read-only memory which stores a program to control the operation of the micro-controller.

28. (previously presented) A unitary portable data storage device according to claim 22, wherein the unitary portable data storage device is sufficiently compact to maximize portability.

29. (currently amended) A unitary portable data storage device according to claim 22, wherein the non-volatile solid-state memory is divided into a plurality of zones;
~~each of said plurality of zones requiring a unique password for access.~~

30. (new) A unitary portable data storage device according to claim 29, wherein one or more of said plurality of zones require a unique password for access.

ABSTRACT

A portable data storage device (10) includes a universal serial bus (USB) coupling device (1) and an interface device (2) is coupled to the USB coupling device (1). The portable data storage device (10) also includes a memory control device (3) and a non-volatile solid-state memory device (4). The memory control device (3) is coupled between the interface device (2) and the memory device (4) to control the flow of data from the memory device (4) to the USB coupling device (1).